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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C.
1940 DUKE STREET
ALEXANDRIA, VA 22314

EXAMINER

WHIPKEY, JASON T

ART UNIT

PAPER NUMBER

2612

DATE MAILED: 07/17/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/391,411

Applicant(s)

SATO ET AL.

Examiner

Jason T. Whipkey

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-24 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 September 1999 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4,6,8.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Drawings

- ✓1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because Figure 11 includes the reference sign "240", which is not mentioned in the description. A proposed drawing correction, corrected drawings, or amendment to the specification to add the reference sign in the description is required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

- ✓2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character "Zs" has been used to designate both the Z-axis and the X-axis in Figure 12. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

3. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

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- ✓ 4. The disclosure is objected to because line 8 of page 4 refers to Figure 1(a), but no such figure exists. Appropriate correction is required.

Claim Objections

- ✓ 5. Claim 21 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim, amend the claim to place it in proper dependent form, or rewrite the claim in independent form.

Claim 21 includes the exact limitation recited in parent claim 15.

Claim Rejections - 35 USC § 112

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

- ✓ 7. Claims 10-12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Each of these claims recites the limitation "the deviation correcting device" on line 2. There is insufficient antecedent basis for this limitation in the claim. For

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examination purposes, the claim will be treated as if it reads, "a deviation correcting device".

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. Claims 1, 2, 8, 13, 14, 20, 22, and 24 are rejected under 35 U.S.C. 102(b) as being anticipated by Yamasaki (U.S. Patent No. 5,365,303).

Regarding claims 1 and 13, Yamasaki discloses a shake-control device for an imaging system. Figure 3 shows a camera with shake-detection means 13 (column 7, lines 4-15). Shake-detection means 13 is comprised of angle sensors 13a and 13b (column 7, lines 13-15). Angular velocity sensors may be used in place of angle sensors 13a and 13b (column 7, lines 54-57).

These sensors may be located at any point on any coordinate system, depending on how one defines the coordinate system. In other words, since coordinate systems are an abstract concept and not a physical structure, one could place the origin of a coordinate system anywhere, including at the intersections of sensors 13a and 13b.

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In the embodiment describing the use of angular velocity sensors, it is disclosed that the system includes an integrating circuit 2 to calculate rotary angles with respect to the x-axis and y-axis (column 11, lines 7-16).

Yamasaki's system also includes sequence control section 208 (Figure 19), which acts as a rotation regulator and rotates image sensor table 216 (column 21, lines 54-62).

Regarding claims 2 and 14, Yamasaki teaches that lenses 14a and 14b are moved in response to camera shaking (column 7, lines 20-25). Although not specifically stated, it is inherent that moving lenses in response to a signal requires some type of actuator.

Regarding claims 8, 20, and 24, Yamasaki teaches that image sensor table 216 is rotated to correct for image shaking (column 21, lines 59-62). "Shaking" includes camera body rotation (column 7, lines 20-23).

Regarding claim 22, Yamasaki teaches that lenses 14a and 14b are moved in response to camera shaking (column 7, lines 20-25).

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

12. Claims 3, 4, 6, and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamasaki in view of Onuki (U.S. Patent No. 5,335,032).

Claims 3 and 4 may be treated like claim 1. However, Yamasaki is silent with regard to including an angular velocity sensor on an optical axis.

Onuki discloses an image stabilizing apparatus (Figure 3) with angular acceleration meters 1i and 1j for detecting the angular vibrations of optical axis C. The signals from these meters are integrated by integrator INTEG, shown in Figure 1, to produce an angular velocity calculation (column 6, lines 47-50).

Onuki is silent with regard to using an angular velocity sensor instead of angular acceleration meters to produce angular velocity calculations. However, an advantage to doing so is that fewer parts would be necessary to make the camera. For this reason, it

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would have been obvious at the time of invention for Onuki to substitute angular velocity sensors for angular acceleration meters and integrators.

An advantage to including motion sensors on an optical axis is that an optical axis is the most susceptible to motion, as it is the line of sight for photography. Measuring movement along this axis would allow the camera to correct for more shaking. For this reason, it would have been obvious at the time of invention for Yamasaki to include motion sensors on the optical axis of his camera, such as the ones described by Onuki.

Regarding claim 6, Yamasaki shows in Figure 3 that angular velocity sensor 13a is oriented horizontally.

Regarding claim 23, Yamasaki is silent with regard to using a variable-angle prism to correct for image shaking.

Onuki discloses that a variable-angle prism may be used to correct angular displacement caused by vibration (column 14, lines 52-58). An advantage to using a variable-angle prism is that it can prevent the focal point of a lens from moving (the result of excessive shaking), which causes the image to lose focus. For this reason, it would have been obvious at the time of invention to have Yamasaki's system include a variable-angle prism for image shaking correction.

13. Claims 5, 15, and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamasaki in view of Miyazawa (U.S. Patent No. 5,331,365).

Claims 5 and 15 may be treated like claims 1 and 14, respectively. However, Yamasaki is silent with regard to including a low-pass filter to remove a frequency band over 20 Hz from the outputs of the angular velocity sensors.

Miyazawa discloses a camera shaking detection apparatus with the circuitry shown in Figure 4. The circuitry includes low-pass filter 26, which removes shaking signal components with a frequency of more than 20 Hz (column 4, lines 51-53). As stated in column 5, lines 3-8, the advantage to removing frequencies greater than 20 Hz is that interference may be removed. For this reason, it would have been obvious at the time of invention to have Yamasaki include a low-pass filter that removes shaking signal components with a frequency of more than 20 Hz, such as the one described by Miyazawa.

Claim 21 may be treated like claim 15.

14. Claims 7 and 16-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamasaki in view of Miyazawa and further in view of Onuki.

Claims 7 and 16 may be treated like claims 5 and 15, respectively. However, Yamasaki is silent with regard to including two angular velocity sensors on an optical axis of the camera.

Onuki discloses an image stabilizing apparatus (Figure 3) with angular acceleration meters 1i and 1j for detecting the angular vibrations of optical axis C. Both acceleration meters sense acceleration in horizontal and vertical directions (column 8,

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lines 2-8). The signals from these meters are integrated by integrator INTEG, shown in Figure 1, to produce an angular velocity calculation (column 6, lines 47-50).

Onuki is silent with regard to using an angular velocity sensor instead of angular acceleration meters to produce angular velocity calculations. However, an advantage to doing so is that fewer parts would be necessary to make the camera. For this reason, it would have been obvious at the time of invention for Onuki to substitute angular velocity sensors for angular acceleration meters and integrators.

An advantage to including motion sensors on an optical axis is that an optical axis is the most susceptible to motion, as it is the line of sight for photography. Measuring movement along this axis would allow the camera to correct for more shaking. For this reason, it would have been obvious at the time of invention for Yamasaki to include motion sensors on the optical axis of his camera, such as the ones described by Onuki.

Regarding claim 17, the angular acceleration meters 1i and 1j shown in Figure 3 of the Miyazawa patent may be on or parallel with the optical axis, depending on how one defines the optical axis.

Regarding claim 18, Yamasaki shows in Figure 3 that angular velocity sensor 13a is oriented horizontally. Angular velocity sensor 13a may be on the horizontal axis, depending on how one defines the horizontal axis.

Regarding claim 19, Yamasaki is silent with regard to including a pair of angular velocity sensors to detect shaking in a horizontal direction.

Official Notice is taken that multiple sensors are used often to capture the same measurement. An advantage to using multiple sensors is that a more accurate, averaged result may be produced. For this reason, it would have been obvious at the time of invention for Yamazaki to include duplicate angular velocity sensors.

15. Claims 9-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamasaki in view of Onuki and further in view of Miyazawa.

Claim 9 may be treated like claim 3. However, Yamasaki is silent with regard to including a low-pass filter to remove a frequency band over 20 Hz from the outputs of the angular velocity sensors.

Miyazawa discloses a camera shaking detection apparatus with the circuitry shown in Figure 4. The circuitry includes low-pass filter 26, which removes shaking signal components with a frequency of more than 20 Hz (column 4, lines 51-53). As stated in column 5, lines 3-8, the advantage to removing frequencies greater than 20 Hz is that interference may be removed. For this reason, it would have been obvious at the time of invention to have Yamasaki include a low-pass filter that removes shaking signal components with a frequency of more than 20 Hz, such as the one described by Miyazawa.

Regarding claim 10, Yamasaki teaches that lenses 14a and 14b are moved in response to camera shaking (column 7, lines 20-25).

Regarding claim 11, Yamasaki is silent with regard to using a variable-angle prism to correct for image shaking.

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Onuki discloses that a variable-angle prism may be used to correct angular displacement caused by vibration (column 14, lines 52-58). An advantage to using a variable-angle prism is that it can prevent the focal point of a lens from moving (the result of excessive shaking), which causes the image to lose focus. For this reason, it would have been obvious at the time of invention to have Yamasaki's system include a variable-angle prism for image shaking correction.

Regarding claim 12, Yamasaki teaches that image sensor table 216 is rotated to correct for image shaking (column 21, lines 59-62). "Shaking" includes camera body rotation (column 7, lines 20-23).

Conclusion

16. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason T. Whipkey, whose telephone number is (703) 305-1819. The examiner can normally be reached Monday through Friday from 9 A.M. to 6:30 P.M. eastern daylight time, alternating Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wendy R. Garber, can be reached on (703) 305-4929. The fax phone

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numbers for the organization where this application or proceeding is assigned are (703) 872-9314 for regular communication and (703) 872-9315 for After Final communication.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office, whose telephone number is (703) 306-0377.

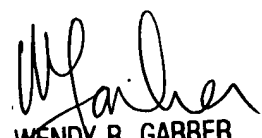
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or faxed to the appropriate number above for communications intended for entry. (For informal or draft communications, please label "**PROPOSED**" or "**DRAFT**".)

Hand-delivered responses should be brought to the sixth floor receptionist of Crystal Park II, 2121 Crystal Drive in Arlington, Virginia.

JTW
JTW
July 1, 2003


WENDY R. GARBER
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600